

WHAT IS CLAIMED IS:

1. A method for metering energy consumption with an electric meter, said method comprising the steps of:

generating metering quantities for a plurality of phase voltages from a multiphase voltage source, including generating revenue-related data;

monitoring voltage changes on at least one of the phase voltages; and

performing a predetermined task in response to a voltage change on at least one of the phase voltages while continuing to generate revenue-related data.

2. A method in accordance with Claim 1 wherein performing a predetermined task in response to a voltage change on at least one of the phase voltages comprises the steps of changing metering form type in accordance with a remaining set of phase voltages when at least one of the phase voltages is lost; and generating metering quantities from the remaining set of phase voltages using the changed metering form type.

3. A method in accordance with Claim 2 wherein the meter is controlled by a microcomputer operable to perform metering in accordance with multiple form types, and said method further comprises the step of assigning a case number to each form type.

4. A method in accordance with Claim 3 wherein assigning a case number to each form type comprises the step of assigning a case number to each form type depending upon a number of elements and a number of wires.

5. A method in accordance with Claim 2 and further comprising the steps of checking voltages at programmed intervals and changing metering form a second time in accordance with the checked voltage.

6. A method in accordance with Claim 2 wherein the meter is in a wye configuration initially and wherein changing metering form type in accordance with a remaining set of phase voltages comprises changing the form to a 2 1/2 element meter.

5 7. A method in accordance with Claim 2 wherein monitoring voltage changes on at least one of the phase voltages comprises periodically checking whether voltage is lost.

8. A method in accordance with Claim 7 wherein periodically checking whether voltage is lost comprises checking three consecutive times at a 15 second interval.

10 9. A method in accordance with Claim 2 wherein monitoring voltage changes on at least one of the phase voltages comprises determining that a voltage is lost when the voltage drops to one-half of a normal voltage.

15 10. A method in accordance with Claim 1 wherein monitoring voltage changes on at least one of the phase voltages comprises the step of logging voltage sags below a predetermined level and voltage swells above a predetermined level.

11. A method in accordance with Claim 10 wherein logging voltage sags below a predetermined level and voltage swells above a predetermined level comprises the step of logging voltages and currents per event.

20 12. A method in accordance with Claim 11 wherein logging voltages and currents per event comprises the step of logging maximum and minimum voltages per phase.

25 13. A method in accordance with Claim 1 wherein performing a predetermined task in response to a voltage change on at least one of the phase voltages comprises the step of logging voltage sags below a predetermined level and voltage swells above a predetermined level.

14. A method in accordance with Claim 1 wherein performing a predetermined task in response to a voltage change on at least one of the phase

voltages comprises the steps of capturing a waveform and storing a representation of the captured waveform in a memory.

15. A method in accordance with Claim 14 wherein the voltage change is one of a voltage sag below a predetermined level and a voltage swell above a predetermined level.

16. A method in accordance with Claim 14 further comprising the step of conditioning performance of the predetermined task upon a setting of a waveform capture flag.

17. A method in accordance with Claim 14 further comprising the step of conditioning performance of the predetermined task upon a count of a waveform counter.

18. A method in accordance with Claim 14 further comprising the step of conditioning an amount of data collected upon a type of triggering event.

19. A method for metering energy consumption with an electric meter, said method comprising the steps of:

generating metering quantities for a voltage source, including generating revenue-related data;

receiving a request for a communication session from an external device; and

producing a static copy of selected revenue-related data in response to the communication session request;

providing the static copy of the selected revenue-related data to the external device while continuing to generate metering quantities.

20. A method in accordance with Claim 19 wherein the selected revenue-related data is current load profile data.

21. A method for metering energy consumption with a microcomputer-controlled electric meter having a memory, said method comprising the steps of:

controlling the meter, using a first program in a first portion of the memory, to generate metering quantities for a voltage source;

writing a second program into a second portion of the memory; and

switching control of the meter to the second program when the second program has been written to the second portion of the memory.

22. A method in accordance with Claim 21 and further comprising the steps of interrupting the first program to store metering data in the memory upon initiating of the writing of the second program into the second portion of the memory, and of processing the stored metering data using the second program after control of the meter is switched to the second program.

23. A method in accordance with Claim 22 wherein the step of switching control to the second program is conditioned upon successful writing of the second program to the second portion of the memory, and further comprising the steps of collecting metering data during the loading of the second program into memory and continuing to controlling the meter, using a first program in a first portion of the memory, to generate metering quantities for a voltage source when the writing of the second program to the second portion of the memory is unsuccessful.

24. A method for metering energy consumption with an electric meter, said method comprising the steps of:

generating metering quantities for a first voltage source;

receiving input data other meters associated with a load; and

processing the input data to produce a value representative of a total energy consumed.

25. A method in accordance with Claim 24 wherein receiving input data from other meters associated with a load comprises the step of receiving pulse inputs from other meters.

5 26. A method in accordance with Claim 24 wherein processing the input data to produce a value representative of a total energy consumed comprises the steps of periodically collecting and scaling the input data, totaling the scaled input data to produce the value representative of the total energy consumed, and storing the value in one location.

10 27. A method for metering energy consumption with an electric meter, said method comprising the steps of:

operating the meter in a first mode of operation;

periodically checking, at period boundaries, for pending changes to the mode of operation; and

effecting the change to the mode of operation after a periodic check.

15 28. A method in accordance with Claim 27 wherein the meter comprises a microcomputer, and said method further comprises the steps of initializing the microcomputer during a power up, checking whether a pending action was scheduled for a period boundary crossed by a power failure, determining what the action was, and performing the action.

20 29. A method in accordance with Claim 28 wherein the action is a change in real time pricing mode.

30. A method in accordance with Claim 27 wherein said change to the mode of operation is a change in a time of use (TOU) schedule.

25 31. An electric meter for metering energy consumption, said meter configured to:

generate metering quantities for a plurality of phase voltages from a multiphase voltage source, the metering quantities including revenue-related data;

monitor voltage changes on at least one of the phase voltages; and

perform a predetermined task in response to a voltage change on at least one of the phase voltages while continuing to generate revenue-related data.

32. An electric meter in accordance with Claim 31 wherein said meter being configured to perform a predetermined task in response to a voltage change on at least one of the phase voltages comprises said meter being configured to change metering form type in accordance with a remaining set of phase voltages when at least one of the phase voltages is lost; and to generate metering quantities from the remaining set of phase voltages using the changed metering form type.

33. An electric meter in accordance with Claim 32 wherein said meter comprises a microcomputer, and said meter is configured to perform metering in accordance with multiple form types; said meter further being configured to assign a case number to each form type.

34. An electric meter in accordance with Claim 33 wherein said meter is configured to assign a case number to each form type depending upon a number of elements and a number of wires.

35. An electric meter in accordance with Claim 32 further configured to check voltages at programmed intervals and to change metering form a second time in accordance with the checked voltage.

36. An electric meter in accordance with Claim 32 configured as in a wye configuration initially and wherein said meter being configured to change metering form type in accordance with a remaining set of phase voltages comprises said meter being configured to change the form to a 2 1/2 element meter.

37. An electric meter in accordance with Claim 32 wherein said meter being configured to monitor voltage changes on at least one of the phase voltages comprises said meter being configured to periodically check whether voltage is lost.

---

5 38. An electric meter in accordance with Claim 37 wherein said meter being configured to periodically check whether voltage is lost comprises said meter being configured to check three consecutive times at a 15 second interval.

---

39. An electric meter in accordance with Claim 32 wherein said meter being configured to monitor voltage changes on at least one of the phase voltages comprises said meter being configured to determine that a voltage is lost when the voltage drops to one-half of a normal voltage.

---

40. An electric meter in accordance with Claim 31 wherein said meter being configured to monitor voltage changes on at least one of the phase voltages comprises said meter being configured to log voltage sags below a predetermined level and voltage swells above a predetermined level.

15 41. An electric meter in accordance with Claim 40 wherein said meter being configured to log voltage sags below a predetermined level and voltage swells above a predetermined level comprises said meter being configured to log voltages and currents per event.

20 42. An electric meter in accordance with Claim 41 wherein said meter being configured to log voltages and currents per event comprises said meter being configured to log maximum and minimum voltages per phase.

25 43. An electric meter in accordance with Claim 31 wherein said meter being configured to perform a predetermined task in response to a voltage change on at least one of the phase voltages comprises said meter being configured to log voltage sags below a predetermined level and voltage swells above a predetermined level.

44. An electric meter in accordance with Claim 31 wherein said meter being configured to perform a predetermined task in response to a voltage change on

at least one of the phase voltages comprises said meter being configured to capture a waveform and store a representation of the captured waveform in a memory.

45. An electric meter in accordance with Claim 44 wherein said meter is configured to respond to voltage changes including a voltage sag below a predetermined level and a voltage swell above a predetermined level.

46. An electric meter in accordance with Claim 44 further configured to condition performance of the predetermined task upon a setting of a waveform capture flag.

47. An electric meter in accordance with Claim 44 further configured to condition performance of the predetermined task upon a count of a waveform counter.

48. An electric meter in accordance with Claim 44 further configured to condition an amount of data collected upon a type of triggering event.

49. An electric meter for metering energy consumption, said meter being configured to:

generate metering quantities for a voltage source, including revenue-related data;

receive a request for a communication session from an external device;

produce a static copy of selected revenue-related data in response to the communication session request; and

provide the static copy of the selected revenue-related data to the external device while continuing to generate metering quantities.

50. An electric meter in accordance with Claim 49 configured to provide current load profile data in response to the communication session request.



51. An electric meter for metering energy consumption, said meter comprising a microcomputer-and a memory, said microcomputer configured to:

control said meter, using a first program in a first portion of said memory, to generate metering quantities for a voltage source;

5 write a second program into a second portion of said memory; and

switch to controlling said meter using the second program when the second program has been written to said second portion of said memory.

52. An electric meter in accordance with Claim 51 wherein said microcomputer is further configured to interrupt the first program to store metering data in said memory upon initiating of the writing of the second program into said second portion of the memory, and to process the stored metering data using the second program after switching to control said meter using the second program.

53. An electric meter in accordance with Claim 52 wherein said microcomputer being configured to switch to controlling said meter using the second program is conditioned upon successful writing of the second program to the second portion of the memory, said microcomputer further being configured to collect metering data during the loading of the second program into memory and to continue to control the meter, using a first program in a first portion of the memory, to generate metering quantities for a voltage source when the writing of the second program to the second portion of the memory is unsuccessful.

54. An electric meter for metering energy consumption, said meter configured to:

generate metering quantities for a first voltage source;

receive input data other meters associated with a load; and

25 process the input data to produce a value representative of a total energy consumed.

55. An electric meter in accordance with Claim 54 wherein said meter being configured to receive input data from other meters associated with a load comprises said meter being configured to receive pulse inputs from other meters.

56. An electric meter in accordance with Claim 54 wherein said meter being configured to process the input data to produce a value representative of a total energy consumed comprises said meter being configured to periodically collect and scale the input data, total the scaled input data to produce the value representative of the total energy consumed, and store the value in one location.

57. An electric meter for metering energy consumption, said meter comprising a microcomputer configured to:

operate the meter in a first mode of operation;

periodically check, at period boundaries, for pending changes to the mode of operation; and

effect the change to the mode of operation after a periodic check.

58. An electric meter in accordance with Claim 57 wherein said meter is configured to initialize the microcomputer during a power up, and said microcomputer is configured to check whether a pending action was scheduled for a period boundary crossed by a power failure, determine what the action was, and perform the action.

59. An electric meter in accordance with Claim 58 wherein said microcomputer is configured to check for changes in real time pricing mode as a pending action.

60. An electric meter in accordance with Claim 57 wherein said microcomputer is configured to check for changes in a time of use (TOU) schedule as a pending change to a mode of operation.